

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
SHEAR PLATE ASSEMBLY, ITEM 115 (PIVOTED, PLANAR) ----- SV778540-56 (1) OR (ORU) ----- SV824133-8 (1)	2/1R	115FM14 External gas leakage (O2 bottle circuit). Seal failure, manifold tube rupture.	END ITEM: Leakage of primary O2 supply to ambient. GFE INTERFACE: Depletion of the primary O2 supply would result in automatic activation of the SOP during EVA if the suit pressure drops to 3.33 psia minimum. Also depletion of the vehicle oxygen supply during charging. MISSION: Terminate EVA. Loss of use of one EMU. During stowage, loss of tank pressure. CREW/VEHICLE: None for single failure. Possible loss of crewman with loss of SOP. TIME TO EFFECT /ACTIONS: Minutes. TIME AVAILABLE: Minutes. TIME REQUIRED: Immediate.	A. Design - There are 6 radial seal locations used to seal the O2 bottle circuit from external leakage. High pressure oxygen o-ring joints include protection rings on the high pressure side to prevent impingement of contaminant particles from reaching the seal. The silicone O-ring seal design dimensions and the rigidity of the assembly provide squeeze under all load conditions. Oxygen temperature and pressure are not extreme, bottle circuit pressure is 900 psid. The oxygen manifold tube has a minimum wall thickness of 0.014 in. which makes the 0.187 O.D. (Nominal) Tube a thick walled cylinder. The maximum operating pressure in the tube is 1050 psi supplied by the primary oxygen bottles. The tube material is Monel -500. Analysis indicates that the minimum tube factor of safety is 3.97 at a burst pressure of 4200 psi, and 15.7 at maximum operating pressure. B. Test - Component Acceptance Test - None PDA Test - The primary O2 Bottles are tested per SEMU-60-010. The bottles are proof tested to 1155-1180 psia for 5 minutes minimum. The bottles are leak tested by pressurizing the bottles to 850-950 psia with a mixture of 98% N2 and 2% He. A helium mass spectrometer is then used to "sniff" for evidence of leakage from the bottles. PLSS PDA is performed on the shearplate assembly. Certification Test - Certified for a useful life of 20 years from the date of manufacture. Successful refurbishment will extend useful life to 30 years max. (ref EMUM1-0491, EMUM1-0027). C. Inspection - O-ring seal grooves are 100% inspected per drawing dimensions and surface finish. O-rings are inspected for surface characteristics per SVHS3432; 100% for Class I and II, and at least 1.5 AQL for Class III O-rings. Backup rings are 100% inspected per drawing dimensions and defects per SVHS8522 high pressure oxygen service. High pressure oxygen joints are trial assembled, removed and examined for evidence of damage or particles caused by the assembly process (MIP). The O-rings are lubricated with Braycoat (SVP 213) prior to final assembly. The tube material is inspected on a lot basis to meet material strength requirements. As a brazed assembly the braze fillets are 100% visually inspected and 100% x-ray inspected for proper coverage. Proof pressure and leakage tests are also performed upon the assembly. D. Failure History - None. E. Ground Turnaround - Tested for non-EET processing per FEMU-R-001, High Pressure O2 Leakage. None for EET processing. F. Operational Use - Crew Response -

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		115FM14	REDUNDANCY SCREENS: A-PASS B-PASS C-PASS	Pre/PostEVA: Trouble-shoot problem. If no success, use 3rd EMU if available. Otherwise terminate EVA. EMU is no go for EVA. EVA: When CWS data confirms an accelerated drop in primary O2 tank pressure, terminate EVA. If SOP activation is also confirmed, abort EVA. Training - Standard training covers this failure mode. Operational Considerations - EVA checklist procedures verify hardware integrity and systems operational status prior to EVA. Flight rules define go/no go criteria related to EMU pressure integrity. Real Time Data System allows ground monitoring of EMU systems.

EXTRAVEHICULAR MOBILITY UNIT
SYSTEMS SAFETY REVIEW PANEL REVIEW
FOR THE
I-115 SHEAR PLATE ASSEMBLY
CRITICAL ITEM LIST (CIL)

EMU CONTRACT NO. NAS 9-97150

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